

REMARKS

Claims 75-134 were previously pending in the application. By this Amendment, claims 75-109 and 127-134 are cancelled without prejudice or disclaimer. New claims 135-177 have been added and claims 110, 111, 115, 118 and 125-126 have been amended to more particularly point out and distinctly claim the invention.

The amended claims and newly added claims are fully supported in the specification as originally filed. The amendments do not add new matter. Applicants respectfully request that the amendments be entered.

The following remarks, in conjunction with the above presented amendments, are believed to be fully responsive to the Office Action mailed December 17, 2003.

I. Claims 115-116 and 125-126 Are Clear and Definite

In the Office Action, claims 115-116 and 125-126 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite.

Applicants submit that the claims are definite and not vague when properly construed in view of the specification by one of ordinary skill in the art.

With respect to claims 115 and 116, Applicants submit that the terms “composite material” and “polymeric material” are well known in the art. “Composite material” refers to a mixture of two or more materials, while a “polymeric material” is a material that contains polymers. (*See, e.g.,* the definitions of “composite”, “material” and “polymer” in *Hawley’s Condensed Chemical Dictionary*, Thirteenth Edition, Revised by Richard Lewis, Van Nostrand Reinhold Company (1997)). It is thus unclear to Applicants what the bases for the Examiner’s objections are as these terms are well known to those skilled in the art.

Applicants would respectfully remind the Examiner that terms in patent claims are not vague unless they prevent one skilled in the art from understanding, in light of the specification, what is claimed. *Andrew Corp. v. Gabriel Electronics, Inc.*, 6 U.S.P.Q. 2d 2010 (Fed. Cir. 1988); *U.S. v. Teletronics, Inc.*, 8 U.S.P.Q. 2d 1217 (Fed. Cir. 1988); *Specialty Composites v. Cabot Corp.*, 6 U.S.P.Q.2d 1601 (Fed. Cir. 1988). A fundamental principle contained in 35 U.S.C. § 112, second paragraph, is that Applicants may act as their own lexicographers. Applicants may use functional language, alternative expressions, negative limitations, or any style of expression or format of a claim which makes clear the boundaries of the subject matter for which protection is sought (MPEP, Section 2173.01). A claim may not be rejected solely because of the type of language used to define the subject matter for which patent protection is sought. *In re Swinehart*, 160 U.S.P.Q. 226 (CCPA 1971).

Moreover, as set forth in the MPEP:

Breadth of a claim is not to be equated with indefiniteness. *In re Miller*, 441 F.2d 689, 169 U.S.P.Q. 597 (CCPA 1971). (MPEP 2173.04) If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. 112, second paragraph. Undue breadth of the claim may be addressed under different statutory provisions, depending on the reasons for concluding that the claim is too broad. If the claim is too broad because it does not set forth that which applicants regard as their invention as evidenced by statements outside of the application as filed, a rejection under 35 U.S.C. 112, second paragraph would be appropriate. If the claim is too broad because it is not supported by the original description or by an enabling disclosure, a rejection under 35 U.S.C. 112, first paragraph would be appropriate. If the claim is too broad because it reads on the prior art, a rejection under either 35 U.S.C. 102 or 103 would be appropriate.

MPEP 2173.02 (emphasis added).

Applicants submit that the specification provides numerous examples of composite materials and polymeric materials that are suitable for use in the present invention (*see, e.g.*, Section 5.1 of specification). One of ordinary skill in the art would readily understand the

meaning of the terms “a composite material” (claim 115) and “a polymeric material” (claim 116) when properly construed in view of the specification and what is known in the art. Accordingly, this aspect of the rejection is improper and is respectfully requested to be withdrawn.

With respect to the objections to claims 125 and 126 regarding the grammatical error relating to improper antecedent basis, Applicants have amended the claims to correct the errors. It is believed the amendments overcome the rejection.

Accordingly, Applicants respectfully submit that the rejections to claims 115-116 and 125-126 under 35 U.S.C. 112, second paragraph, should be withdrawn.

II. Claims 110-126 are Patentable Over the Cited References

A. Rejection of claims 110-116, 118-121 and 124-126 under 35 U.S.C. § 102(a) as allegedly being anticipated by US Patent No. 5,560,811 to Briggs et al. (“Briggs”).

Applicants submit that *Briggs* does not disclose the presently claimed invention. A finding of anticipation under 35 U.S.C. § 102 requires the disclosure in a single prior art reference of each element of the claim under consideration. *W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983). There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. *Scripps Clinic & Research Found. v. Genetech Inc.*, 927 F.2d 1565, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991).

Independent claim 110 recites:

110. A multi-well plate comprising a plurality of wells, wherein at least two of said wells of said multi-well plate have independently addressable electrodes centered at the bottom of said wells.

Briggs does not disclose the multi-well plate defined by claim 110. In the Office Action, the Examiner asserted that *Briggs* discloses an apparatus which “comprises placing samples in

multi well plates where an array of electrodes are connected to the bottom of each well. (See Figure 4A and 4B)".

Contrary to the Examiner's assertion, Figures 4A and 4B do not show multi-well plates with electrodes on the bottom of the wells. *Briggs* relates to the "field of separation of biomolecules and, in particular, separations by capillary electrophoresis and the use of the capillary electrophoresis to detect such molecules" (Column 1, lines 7-10). Referring to Figure 4, *Briggs* teaches:

FIG. 4a shows the **sample handling plate 71** with an array of sample handling wells 74 with an corresponding array of sipper capillaries 82. The array of sipper capillaries is aligned with wells of a **multiwell plate which contain samples 85**. When the sipper capillaries 82 are in the sample, an aliquot of sample is transferred to the sipper capillary by wicking action. The sample handling plate 71 is then moved to **base plate 72**, as shown in FIG. 4b. Sample handling plate 71 and base plate 72 fit together to form a sealed inner chamber 69 which can be pressurized or evacuated through port 73. In this way, the samples in capillaries 82 can be manipulated and eventually presented in sample handling wells 74 for electrophoresis. FIG. 4c shows how the **electrophoresis separation plate(s) 100** containing an array of electrophoresis capillaries 101 are aligned with the sample handling plate wells 74.

Column 9, line 53 - Column 10, line 2 (emphasis added).

Multi-well plate 85 is simply a multi-well plate for holding samples and contains no electrodes.

The *Briggs* sampling handling plate 71 extracts the sample 85 from the multi-well plate through sipper capillaries 82 and moves them to sample handling wells 74. Figures 5a and 5b of *Briggs* show cross-sectional views of sample handling plate 71 and show that it comprises a vertical channel a-b interrupted by a porous membrane that defines the bottom wells 74. The membrane is made of a porous material. Suitable membrane materials that are cited by *Briggs* are all non-conductive materials such as regenerated cellulose, cellulose acetate, polysulfone,

polyvinylidene fluoride, polycarbonate and the like (*Briggs* at column 10, lines 14-23). Figures 5a and 5b show no electrodes. Even if the sampling handling plate comprised electrodes, the arrangement of the membranes at the bottom of the wells would prevent the electrodes from being positioned at the bottom of the wells.

The *Briggs* base plate 72 has neither wells nor electrodes and has as its sole purpose the sealing against sample handling plate 71 to form a sealed inner chamber, which can be pressurized or evacuated to manipulate and eventually present samples for electrophoresis through the capillaries 101 of the electrophoresis separation plate 100 (*Briggs* at column 9, lines 60-66).

The electrophoresis separation plate 100, shown in more detail in Figure 10 of *Briggs*, has 8 electrophoresis capillaries mounted on a frame. The separation plate is not a multi-well plate.

Therefore, the figure does not disclose a multi-well plate with wells having “independently addressable electrodes centered at the bottom of said wells”.

With respect to claim 112, *Briggs* also fails to disclose the use of a mask having a plurality of holes seal against the electrodes.

With respect to claim 126, the light detector in *Briggs* is adapted to measure light emitted from capillaries held between electrodes and not to measure light emitted from the electrodes themselves (*see* Figure 10 of *Briggs*),

Accordingly, the rejection of claims 110-116, 118-121 and 124-246 is seen by Applicants as improper and should be withdrawn.

B. Rejection of claims 110-111, 113-116 and 118-120 under 35 U.S.C. § 102(a) as allegedly being anticipated by US Patent No. 6,033,850 to Purvis (“*Purvis*”).

Purvis does not disclose the presently claimed invention. In the Office Action, the Examiner asserted that “*Purvis* teaches a device for DNA analysis, and the device comprises a plurality of wells where the wells forming an array of electrodes which dip into the plurality of wells for DNA denaturation process. (See claim 23).” Claim 23 of *Purvis* recites:

23. **An electrochemical cell** for use in the denaturation of nucleic acid comprising a plurality of wells, each said well having an electrically conductive inner surface constituting an electrode, said plurality of wells forming a first array of electrodes, and a second array of electrodes separate from said first array of electrodes, wherein at least one electrode of said second array of electrodes dips into at least one well of said plurality of wells so as to reach to close proximity to the electrically conductive inner surface of said at least one well.

Purvis relates to processes for the treatment of nucleic acid material in order to effect a complete or partial change from double-stranded form to single-stranded form and to processes of amplifying or detecting nucleic acids involving such denaturation processes (Column 1, lines 6-9). *Purvis* discloses **electrochemical cells** for carrying out the reaction involving the separation of nucleic acid strands by the application of an electric field. In contrast, the present claims relate to multi-well plates. *Purvis* does not disclose a multi-well plate as that term is known in the art by those of ordinary skill in the art. Moreover, *Purvis* also fails to disclose “independently addressable electrodes centered at the bottom of said wells”.

With respect to claims 118 and 119, *Purvis* fails to disclose a multi-well plate “further comprising at least one counter electrode within each well” or “further comprising electrical contacts connected to said electrodes”.

Therefore, Applicants respectfully submit, *Purvis* cannot anticipate the claimed subject matter. Accordingly, the rejection of claims 110-111, 113-116 and 118-120 is seen as improper and should be withdrawn.

C. Rejection of Claims 122-123 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Briggs in view of US Patent No. 5,541,113 to Siddigi et al. (“Siddigi”).

Briggs neither teaches nor suggests the presently claimed invention for the reasons set forth above. *Siddigi* is not seen to compensate for the deficiencies of *Briggs* as a reference. More specifically, like *Briggs*, *Siddigi* does not disclose the presently claimed multi-well plates. Thus, *Briggs*, whether alone or in combination with *Siddigi*, does not render the presently claimed subject matter obvious.

A finding of obviousness under 35 U.S.C. § 103(a) requires a determination that the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made. *Graham v. Deere*, 383 U.S. 1 (1956). The relevant inquiry is whether the prior art suggest the invention and whether the prior art provides one of ordinary skill in the art with a reasonable expectation of success. Both the suggestion and the reasonable expectation of success must be found in the prior art. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991).

Moreover, there is no reasonable basis to combine the teachings of *Siddigi* with those of *Briggs*. In the Office Action, at pages 4-5, the Examiner asserts that “it would have been obvious to one of ordinary skill in the art...to have provided Briggs with the chemiluminescence methodologies as taught by Siddigi.” It is unclear what the basis is for the assertion that it would have been obvious to combine the teachings of *Siddigi* with those of *Briggs* to result in the claimed invention. This lack of clear articulation of the alleged motivation to combine invalidates a *prima facie* case of obviousness.

The MPEP, at Section 706.02(j), states that to establish a *prima facie* case of obviousness there must be some suggestion in the references or in the knowledge generally available to one of ordinary skill in the art to combine reference teachings. Construing this exact issue, the Federal Circuit recently stated:

The genius of invention is often a combination of known elements which in hindsight seems preordained. To prevent hindsight invalidation of patent claims, the law requires some “teaching, suggestion or reason” to combine cited references. ***Gambro Lundia AB v. Baxter Healthcare Corp.***, 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997). When the art in question is relatively simple, as is the case here, the opportunity to judge by hindsight is particularly tempting. Consequently, the tests of whether to combine references need to be applied rigorously. See ***In re Dembiczak***, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999), limited on other grounds by ***In re Gartside***, 203 F.3d 1305, 53 USPQ2d 1769 (2000) (guarding against falling victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher).

Whether a motivation to combine prior art references has been demonstrated is a question of fact. ***Winner Int'l Royalty Corp. v. Wang***, 202 F.3d 1340, 1348, 53 USPQ2d 1580, 1586 (Fed. Cir. 2000). The assessment of whether to combine references in a given case has sometimes been viewed conceptually as a subset of the first Graham factor, the scope and content of the prior art. See, e.g., *id.*; ***Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH***, 139 F.3d 877, 881-83, 886, 45 USPQ2d 1977, 1981-82, 1985 (Fed. Cir. 1998). Although that view is not incorrect, accurate assessment of whether to combine references may require attention to other Graham factors. For example, the level of skill in the art may inform whether the artisan would find a suggestion to combine in the teachings of an exemplar of prior art. Where the level of skill is high, one may assume a keener appreciation of nuances taught by the prior art. Similarly, appreciation of the differences between the claims in suit and the scope of prior art references—a matter itself informed by the operative level of skill in the art—informs the question of whether to combine prior art references. At bottom, in each case the **factual inquiry whether to combine references must be thorough and searching.** (emphasis added)

McGinley v. Franklin Sports Inc., 60 U.S.P.Q.2d 1001, 1008 (Fed. Cir. 2001). Further amplifying this holding, the Federal Circuit added:

In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.”); ***In re Fritch***, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (the examiner can satisfy the burden of showing obviousness of the combination “only by showing some objective teaching in the prior art or that knowledge

generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references”).

In re Lee, 61 U.S.P.Q.2d 1430, 1434 (Fed. Cir.2002).

The Examiner has shown no such objective teaching. Indeed, Applicants submit that no such objective teaching exists. More specifically, as discussed above, *Briggs* relates to the “field of separation of biomolecules and, in particular, separations by capillary electrophoresis and the use of the capillary electrophoresis to detect such molecules” (Column 1, lines 7-10). *Siddigi* relates to “the detection of an analyte in an aqueous solution at a physiological pH using an electrochemical luminescent transition metal complex label” (Column 1, lines 7-13). There is simply no indication that the electrodes of *Briggs* would be useful in electrochemiluminescence measurements and there is no motivation in either reference that that would lead one of ordinary skill in the art to combine the references.

Therefore, the rejection of claims 122-123 under 35 U.S.C. § 103(a) is respectfully submitted as being improper and should be withdrawn.

CONCLUSION

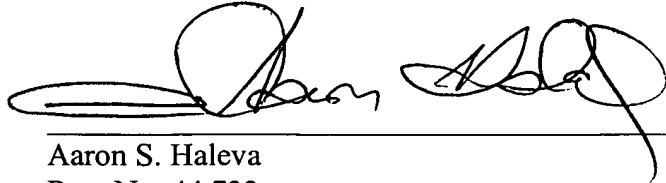
In view of the amendments and remarks herein, Applicants believe that each ground for rejection or objection made in the instant application has been successfully overcome or obviated, and that all pending claims are now in condition for allowance. Withdrawal of the Examiner’s rejections and objections, and allowance of the current application are respectfully requested.

The Examiner is invited to telephone the undersigned in order to resolve any issues that might arise and to promote the efficient examination of the current application.

No additional fee is believed necessary for entry of this Amendment. However, the Commissioner is hereby authorized to charge any additional fee to Deposit Account No. 50-0540.

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Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Aaron S. Haleva', is written over a horizontal line.

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